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Collembola Poduromorpha of South Africa

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Abstract. One new genus and 8 new species of Poduromorpha (Collembola) from a South African subtropical indigenous forest are described.

Key words. Collembola, Poduromorpha, new species, new genus, South Africa, indigenous forest.

Introduction

Up till now only 9 papers concerning springtails from South Africa were published: Womersley (1934), Goto (1953), Yosii (1957), Paclt (1959, 1964, 1965, 1967), Coates (1968a, 1968b, 1969), Snider (1988). Although four of them include species of Poduromorpha, most of these species appear dubious. Following a bibliographical analysis, we have accepted only 12 valid species of Poduromorpha for South Africa. These are: *Hypogastrura viatica* (Tullberg, 1872), *Choreutinula lobata* Yosii, 1959, *Xenylla maritima* Tullberg, 1896, *Brachystomella africana* Yosii, 1959 (= *B. parvula africana* Yosii, 1959), *Setanodosa capitata* (Womersley, 1934), *Aethiopella flavoantennata* (Philipschenko, 1926), *Oudemansia barnardi* (Womersley, 1934), *Anurida maritima* (Guérin, 1836), *Ectonura natalensis* (Womersley, 1934), *E. oribiensis* (Coates, 1968a), *Vitronura joanna* (Coates, 1968a), *Neanura muscorum* (Templeton, 1935).

In this paper we present a study of a small collection from an indigenous forest in Saasveld near George, sent by Dr. V. Nicolai (University of Marburg, Germany). We describe 8 new species and one new genus belonging to four families of Poduromorpha.

The type material studied in this paper is deposited in the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Cracow (ISEA) and in the Laboratoire d'Entomologie, Muséum national d'Histoire naturelle, Paris (MNHN).

Systematic Account

Hypogastruridae

Xenylla capensis sp. n. (Figs 1—5)

Holotype: female; **paratypes:** 2 males, 3 females and 6 juv., some specimens in alcohol (ISEA); **paratypes:** 2 females, 1 male and 2 juv. (MNHN).

Type locality: South Africa, Saasveld, near George, subtropical indigenous forest, pitfall traps, 17-XII-1986—17-I-1987, leg. V. Nicolai.

Description: Holotype length 1.17 mm, length of paratypes between 0.8 mm (males) and 1.15 mm (females). Colour in alcohol: spotted blue, ocular plate black. Tegumental grain fine.

Antennal segment I with 7 setae, II with 12 setae. Sensory organ of antennal segment III consisting of 2 small globular sensillae covered by tegumentary fold, 2

guard sensillae and one ventro-lateral microsensilla. Antennal segment IV with simple apical vesicle, subapical "organite" small, but distinct, dorso-external side with 2 subcylindrical, thick sensillae, one thin sensilla, one microsensilla and 2 dorso-internal very slender (Fig. 2).

Ocelli 5+5. Buccal cone, maxillae and mandibles typical for the genus; 2 sublobal setae present.

Tibiotarsi I, II, III with 19, 19, 18 setae, two of which are capitated tenent hairs. Claw with distinct distal inner tooth (Fig. 3).

Ventral tube with 4+4 setae. Tenaculum with 3+3 teeth. Mucro and dens separated; dens with 2 setae; mucro with slender lamella near the top; dens 3.2 of the same length as mucro (Fig. 4).

Dorsal chaetotaxy as Fig. 1 (nomenclature after Gama, 1988), with serrated setae, long setae s and th. II with s'. Head setae: a0 present, p1 absent, p2, p3 present, d1 present, L3 shorter than L1. Thorax setae: a2 of th. III behind a1, p2 farther forwards than p1, la1 of th. II—III absent, la2, la3 of th. II—III present, m3 of th. II—III present, p3 of th. II—III present. Abdomen setae: m3, p3 of abd. IV present, a2 of abd. V absent.

Ventral chaetotaxy. Head setae: m3, p1 present. Thorax setae: pair of setae of th. II—III absent. Abdomen setae: abd. II — a6, p1, p6 present, p2, absent, abd. III — a6, p5 present, abd. IV — m1, m3 present, m2 absent.

Abdomen IV with a pair of dorso-lateral tegumental structure (Fig. 5).

Abdomen VI with two small anal spines.

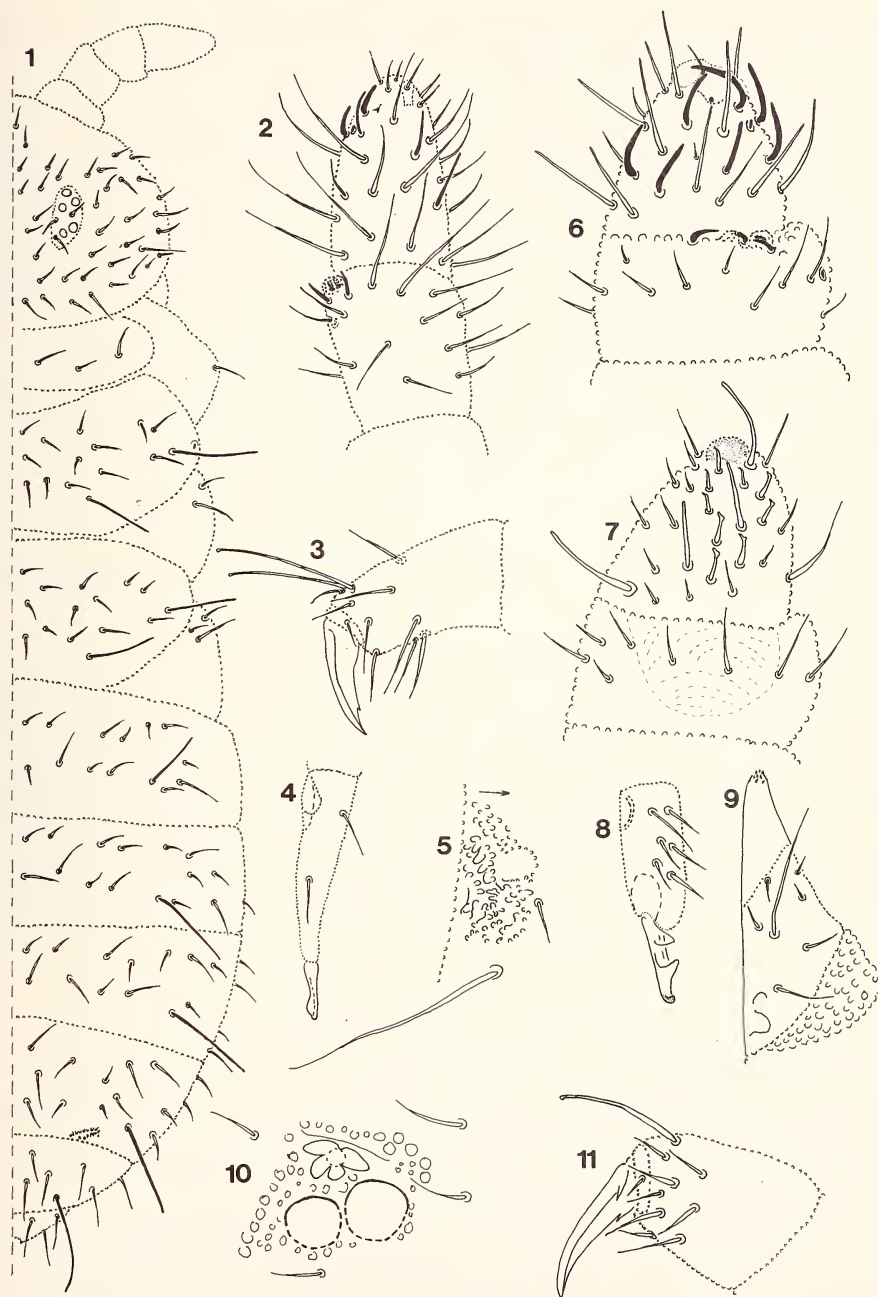
Discussion: Morphologically this species is close to *X. gisini* Cardoso, 1968 from Mozambique, *X. zairensis* Martynova, 1979 from Zaïre and *X. stachi* Gama, 1966 from Angola. All these species have the same type of dens, as well as the same number of tenent hairs on legs and of antennal segment IV sensillae. Following the phylogenetic reasoning of Gama (1988) all these species have the same chaetotaxic characters: b (seta p1 on head absent), h1 (seta a2 on thorac III behind a1), h2 (seta p2 on thorax III farther forward than p1), i (seta la1 on thorax II and III absent), q (seta a2 on abdomen II absent) and t (pair of setae on sternites thoracic II and III absent). *X. capensis* sp. n. differs from the other species by the presence of characters g (seta 13 longer than seta 11) and a5 (seta m2 on abdominal sternite IV absent). On the other hand, in the ventral chaetotaxy of abdominal segment II seta p1 is present, but p2 is absent (character v of Gama: setae p1 and p2 absent) and for this reason, it is impossible to take into consideration character v of Gama. In the presence of tegumentary fold in the sensory organ of ant. III and in the tegumentary structure of abdominal segment IV, the new species is close to the species of *Xenylla* belonging to the group *thibaudi* Massoud, 1965.

Odontellidae

Odontella (Odontella) sylvatica sp. n. (Figs 6–12)

Holotype: female; paratypes: 7 and some specimens in alcohol (ISEA); paratypes: 4 (MNHN).

Type locality: South Africa, Saasveld, near George, subtropical indigenous forest, pitfall traps, 17-XII-1986–17-I-1987, leg V. Nicolai.



Figs 1—11: *Xenylla capensis* sp. n.: 1) dorsal chaetotaxy; 2) antennal segment III and IV; 3) leg III; 4) furca; 5) dorso-lateral tegumental structure. *Odontella (Odontella) sylvatica* sp. n.: 6) antennal segment III and IV, dorsal side; 7) antennal segment III and IV, ventral side; 8) furca; 9) left side of labium; 10) postantennal organ and anterior ocelli; 11) leg III.

Description: Holotype length 1.06 mm, length of paratypes between 0.48 mm and 0.73 mm. Colour in alcohol: light blue, ocular plate dark blue. Tegumental grain round, regular on the whole body.

Antennal segment I with 7 setae, II with 10 setae. Sensory organ of antennal segment III consisting of 2 small tubular sensillae bent in the same direction, covered by two separate papillae, of 2 guard sensillae and one ventral microsensilla. Eversible ventral sac between ant. III and IV present. Antennal segment IV without apical vesicle, but with apical protuberance finely granulated, subapical "organite" distinct, with one dorso-external microsensilla and 7 subcylindrical, long sensillae (Fig. 6). Ventral side of antennal segment IV with sensory rasp with 9 modified setae and 4 subcylindrical blunt setae (Fig. 7).

Ocelli 5+5. Postantennal organ amiboid with four lobes (Fig. 10). Buccal cone elongated. Labium with very small apical spines (Fig. 9). Only right mandible present. Fulcro: ratio of postero-internal and postero-external extensions is like 1.65 : 1.

Tibiotarsi I, II, III with 17, 17, 16 setae, one of which is weak tenent hair. Claw with one inner tooth and one pair of lateral teeth (Fig. 11).

Ventral tube with 4+4 setae. Tenaculum with 3+3 teeth. Dens with 6 setae, mucro with two lobes (Fig. 8). Mucro : dens ratio = 1 : 1.9.

Dorsal chaetotaxy as in Fig. 12. Thorax II and III without seta m1, with microsensilla s'.

Abdomen VI without anal spines.

Discussion: *Odontella* (*Odontella*) *sylvatica* sp. n. belongs to the species group of *O. (O.) loricata* Schaeffer, 1897 by the presence of sensory rasp, the absence of dens apical lobes and anal spines. Among these species, *O. (O.) sylvatica* sp. n. is close to *O. (O.) contrerasi* Izarra, 1972, with the same shape of claws and the number of dens setae. The new species differs from *O. (O.) contrerasi* in the number of sensillae on antennal segment IV (7 against 5), the shape of postantennal organ (quadrangular instead of triangular), the presence of leg tenent hair and the dorsal chaetotaxy consisting of short, denticulate setae in *O. (O.) contrerasi*. On the abdominal segment VI, both species have some slightly elongated denticulate setae, but in *O. (O.) contrerasi* they are also clavated setae.

Neanuridae: Brachystomellinae

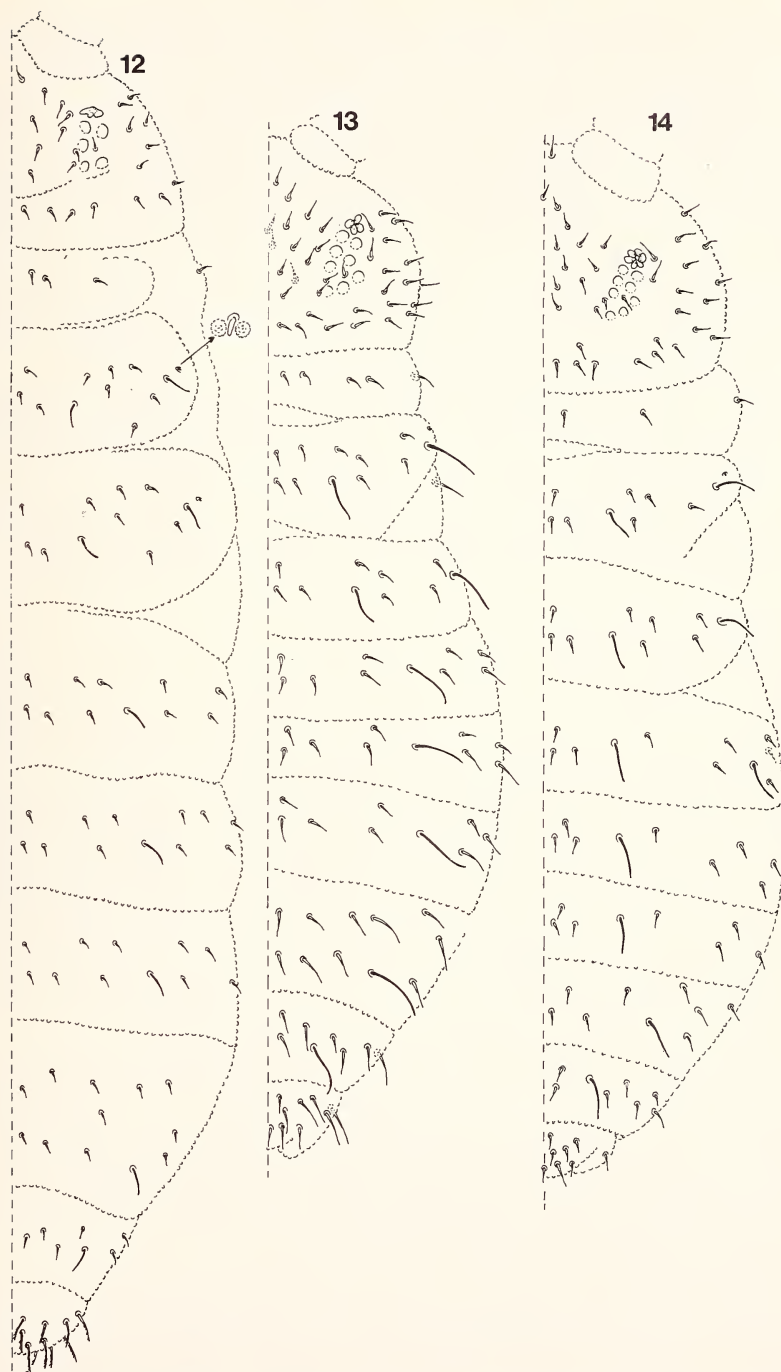
Brachystomella coatesi sp. n. (Figs 13, 15–21)

Holotype: female; paratypes: 1 male juv., 10 females, 6 juv. and some specimens in alcohol (ISEA); paratypes: 7 females, 4 juv. (MNHN).

Type locality: South Africa, Saasveld, near George, subtropical indigenous forest, pitfall traps, 17-XII-1986–17-I-1987, leg. V. Nicolai.

Description: Holotype length 0.5 mm, length of paratypes between 0.5 mm and 0.6 mm. Colour in alcohol: violet-blue, dark ocular plate. Tegumental grain fine.

Antennal segment I with 7 setae, II with 12 setae. Sensory organ of antennal segment III with 2 small tubular sensillae bent in the same direction, 2 guard sensillae and one ventro-lateral microsensilla. Antennal segment IV with simple apical vesicle, subapical "organite", 5 subcylindrical distinct sensillae, one dorso-external microsensilla, ventral side without sensory rasp (Figs 15–16).



Figs 12—14: dorsal chaetotaxy: 12) *Odontella (Odontella) sylvatica* sp. n.: 13) *Brachystomella coatesi* sp. n.: 14) *Brachystomella georgensis* sp. n.

Ocelli 8+8. Postantennal organ with 4 vesicles, with blue pigmentation, 1.6–1.9 times larger than ocellus B (Fig. 19). Buccal cone typical for the genus: labium and labrum as in Fig. 17. Maxillary head with 9 teeth (Fig. 20).

Tibiotarsi I, II, III with 18, 18, 17 setae, with acuminate tenent hair. Claw with distinct inner tooth, without lateral ones (Fig. 18). Claw : tibiotarsus ratio = 1 : 0.97.

Ventral tube with 3+3 setae. Tenaculum with 3+3 teeth. Dens with 6 setae; mucro elongated with inner lamella large on the basis (Fig. 21). Mucro : dens ratio = 1 : 1.66.

Dorsal chaetotaxy as in Fig. 13, with long sensory setae 3.1 times longer than ordinary setae. Sensory chaetotaxy is 022/11111 per half tergite. Thorax I with 4+4 setae. Thorax II with 4+4 central setae (a1, a2, p1, p2 per half tergite), thorax III with 3+3 central setae (a1, p1, p2 per half tergite).

Discussion: This new species differs from all other species of the genus *Brachystomella* by the combination of the following characters: presence of only 5 distinct sensillae and absence of sensory rasp on ant. IV, presence of 6 setae on the dens, length of the claw and particular chaetotaxy.

Derivatio nominis: The new species is dedicated to T. J. Coates in acknowledgement of his contribution to the knowledge of South African springtails.

Brachystomella georgensis sp. n. (Figs 14, 22–26)

Holotype: female; paratypes 2 females, 2 juv. (ISEA); paratypes: 1 female, 2 juv. (MNHN).

Type locality: South Africa, Saasveld, near George, subtropical indigenous forest, pitfall traps, 17-XII-1986–17-I-1987, leg. V. Nicolai.

Description: Holotype length 0.63 mm; the same length of paratypes. Colour in alcohol: dark violet-bluish, ocular plate dark. Tegumental grain middle-sized.

Antennal segment I with 7 setae, II with 12 setae. Sensory organ of antennal segment III consisting of 2 small sensillae bent in the same direction, 2 guard sensillae of which the ventral one is longer than the dorsal one and of ventro-lateral microsensilla. Antennal segment IV with simple apical vesicle, distinct subapical “organite”, 6 subcylindrical sensillae and one dorso-external microsensilla (Fig. 22). Ventral side of ant. IV of some blunt setae but no sensory rasp (Fig. 23).

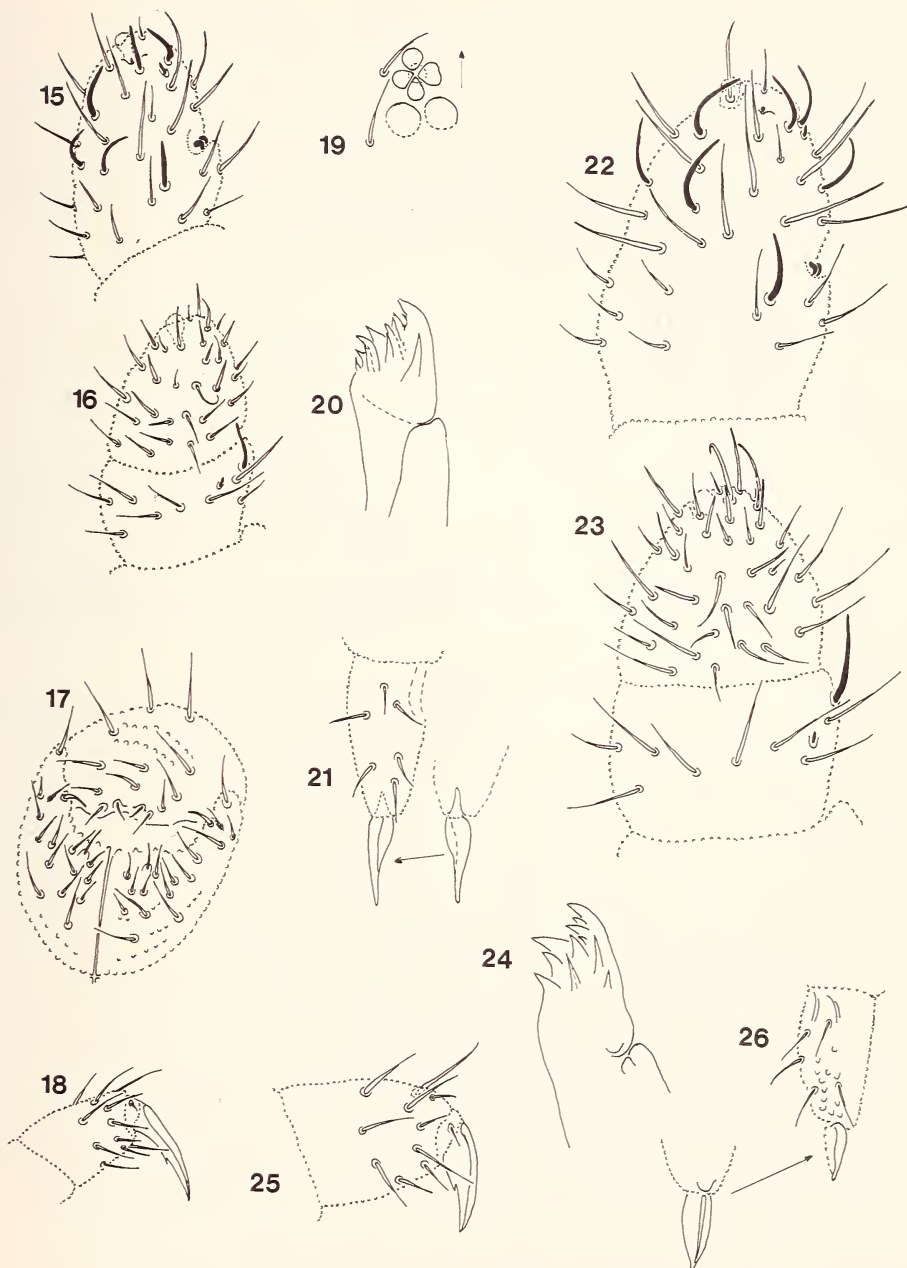
Ocelli 8+8. Postantennal organ with 6 or 7 vesicles arranged in a circle, with blue pigment. PAO : ocellus B ratio = 1.8 : 1. Buccal cone typical for the genus. Maxillary head with 9–10 teeth disposed in three rows (Fig. 24).

Tibiotarsi I, II, III with 18, 18, 17 setae, with acuminate tenent hair. Claw with inner tooth, without lateral teeth (Fig. 25). Claw : tibiotarsus ratio = 1 : 1.8.

Ventral tube with 3+3 setae. Tenaculum with 3+3 teeth, dens with 5 setae, mucro of *parvula*-type (Fig. 26) two times shorter than dens.

Dorsal chaetotaxy as in Fig. 14 with short ordinary setae and long sensory setae. Sensory chaetotaxy is 022/21111 per half tergite. Thorax I with 2+2 setae. Thorax II to abdomen IV with 3+3 central setae (a1, p1, p2 per half tergite).

Discussion: The new species is very close to *Brachystomella africana* Yosii, 1959, very briefly described from the Cape Province. The two species differ by shape of maxillary head and claw (without an inner tooth in *B. africana*). *Brachystomella*



Figs 15—26: *Brachystomella coatesi* sp. n.: 15) antennal segment III and IV, dorsal side; 16) antennal segment III and IV, ventral side; 17) labrum and labium; 18) leg III; 19) postantennal organ and ocelli A, B; 20) maxilla, 21) furca. *Brachystomella georgensis* sp. n.: 22) antennal segment III and IV, dorsal side; 23) antennal segment III and IV, ventral side; 24) maxilla; 25) leg III; 26) furca.

georgensis sp. n. is also very close to *B. platensis* Najt & Massoud, 1974 from Argentina and Australia. Both species share the following characters: presence of 5 sensillae and absence of sensory rasp on ant. IV, type of furca and body chaetotaxy. They differ by the shape of apical vesicle of ant. IV (simple in *B. georgensis* and bi- or trilobated in *B. platensis*), the number of vesicles of postantennal organ (6–7 in *B. georgensis* and 5 in *B. platensis*), the number of teeth of maxillary head (9–10 teeth in *B. georgensis* and 7 teeth in *B. platensis*) and chaetotaxy of legs (3 tenent hairs and spine-like setae on the tibiotarsus and femur in *B. platensis*).

Probrachystomellides gen. n.

Diagnosis: Typical habitus for *Brachystomellides* Arlé, 1959. Antennae shorter than head length. Sensory organ of antennal segment III without tegumentary fold. Antennal segment III and IV fused dorsally. Antennal segment IV with apical vesicle, subapical "organite", dorso-external microsensilla, subcylindrical sensillae and sensory rasp well developed. Ocelli 8+8. Postantennal organ present. Buccal cone short. Labrum with 2/234 setae, among which 4 marginal setae are long and fine. Labium with stick-like papillary seta L. Mandibles without molar plate. Simple globular maxillary head. Cardo present. Ventral tube with 3+3 setae. Tenaculum present. Furca well developed. Reduced dorsal chaetotaxy of *Brachystomella*-type. Microsensilla s' present only on thorax II. Abdomen VI dorsally visible, without anal spines.

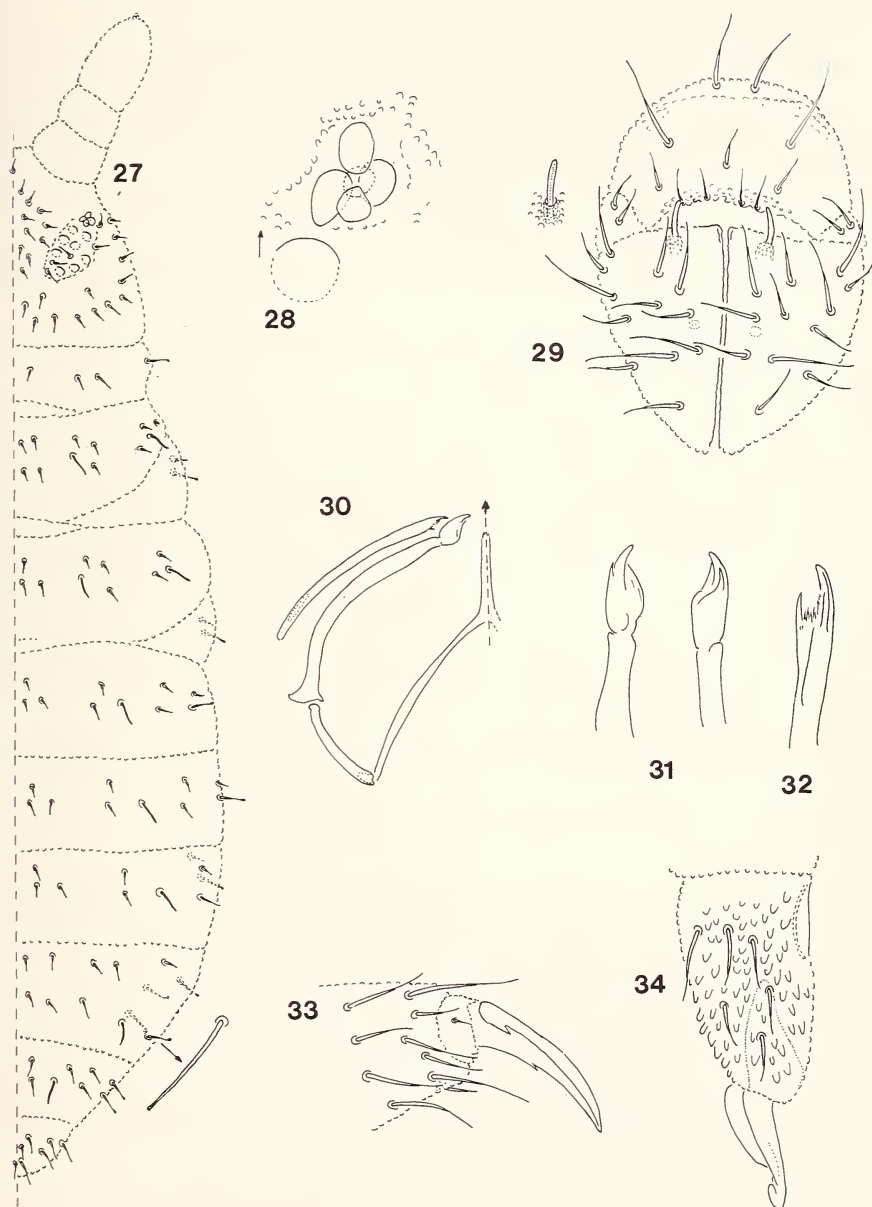
Type species: *Probrachystomellides nicolaii* sp. n.

Discussion: The presence of mandibles separates the new genus from all other genera of the subfamily Brachystomellinae. *Probrachystomellides* gen. n. is close to *Brachystomellides* Arlé, 1959 known from Brazil, Venezuela, French Guyana, Argentina and to *Massoudella* Ellis & Bellinger, 1973 (= *Australella* Stach, 1949 nec Anandale, 1910) from Australia. These three genera have a simple globular maxillary head (except one species: *B. micropilosa* Cassagnau & Rapoport, 1962 (with numerous teeth), sensory rasp (also present in *B. compositus* Arlé, 1959, 8+8 ocelli, seta L of labium (also present in *B. compositus*). At the same time, the new genus differs from *Brachystomellides* and *Massoudella* by the shape of mucro (which in both these have a very elongated apical part and a pocket in basal part), by the absence of spiniform setae on the dens (they are absent also in *B. compositus*). *Probrachystomellides* gen. n. differs from *Brachystomellides* also by the presence in this last genus of 4 strong and long marginal setae on the labrum (formula setae: 2/334), labium with very fine papillary setae L and spine-like setae: A, C or D and complicated mucro. The new genus differs from the genus *Massoudella* by the absence of labial special structure and by the presence of 4 vesicles in the postantennal organ (only one vesicle divided in 4 lobes in *Massoudella*).

Probrachystomellides nicolaii sp. n. (Figs 27–36)

Holotype: female; paratypes: 9 females, 5 males, 11 juv. and some specimens in alcohol (ISEA); paratypes: 11 females, 3 males, 8 juv. (MNHN).

Type locality: South Africa, Saasveld, near George, subtropical indigenous forest, pitfall traps, 17-XII-1986–17-I-1987, leg. V. Nicolai.



Figs 27—34: *Probrachystomellides nicolaii* gen. n., sp. n.: 27) dorsal chaetotaxy; 28) post-antennal organ; 29) labrum and labium; 30) left half of mouth-part structure; 31) maxillae; 32) mandible; 33) leg III; 34) furca.

Description: Holotype length 1.3 mm, length of paratypes between 0.8 mm and 1.5 mm. Colour in alcohol grey-blue, larger ocular plate dark. Tegumental grain middle- or large-sized.

Antennal segment I with 7 setae, II with 12 setae. Sensory organ of antennal segment III consisting of 2 small hammer-shaped sensillae, 2 guard sensillae, from which the dorsal one is longer than the ventral one, and one ventro-lateral microsensilla (Fig. 35). Antennal segment IV with trilobated apical vesicle, subapical globular "organite", only 6 short subcylindrical sensillae, out of which 2 are in dorso-external position and 4 in dorso-internal position, and one dorso-external microsensilla, some of the normal setae blunt at top (Fig. 35). Ventral side of ant. IV with sensory rasp consisting of about 44 modified sensillar setae and some normal blunt setae (Fig. 36).

8+8 subequal ocelli. Postantennal organ with 4 large very fine granulated vesicles (Fig. 28). PAO : ocellus B ratio = 1.12–1.44 : 1.

Buccal cone short, labrum with 2/234 setae; labium with setae A–G, stick-like papillary seta L, blunt at top and 1+1 small hypodermal glandular "organite" at the basis of setae B; maxillary palp with 2 setae (Fig. 29). Postlabial setae 2+2. Maxillary head with one apical and one subapical tooth (Fig. 31), cardo present (Fig. 30). Mandibles with apical and basal teeth and denticulation between teeth (Fig. 32).

Tibiotarsi I, II, III with 18, 18, 17 setae, with one dorsal and one ventral acuminate tenent hair. Long claw with one inner tooth and a pair of large lateral teeth (Fig. 33).

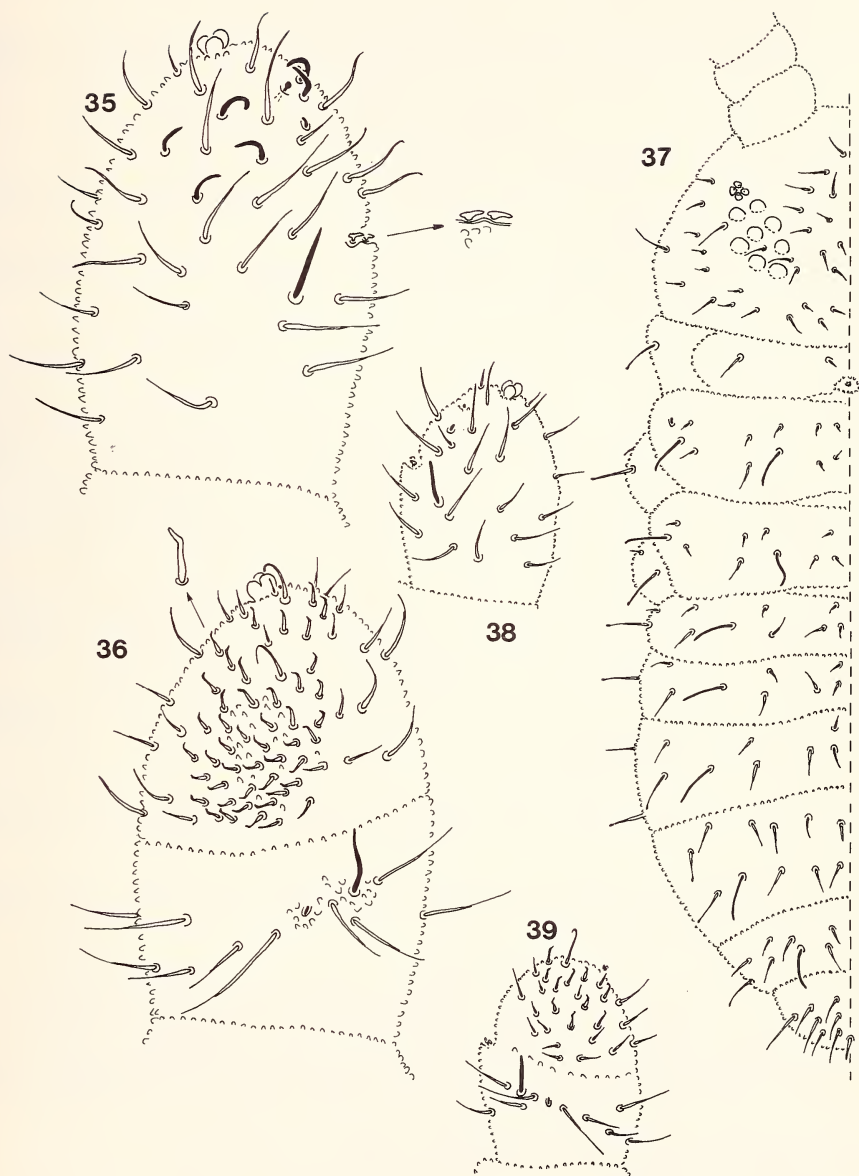
Ventral tube 4+4 setae. Tenaculum with 3+3 teeth. Dens with very strong dorsal granulation, with 6 fine setae. Mucro elongated, with curved apex. External lamella reaching 0.6 of mucro length (Fig. 34).

Dorsal chaetotaxy as Fig. 27. Sensory setae 2.3 times longer than ordinary setae on th. II — abd. IV and 1.4 times on abd. V. Sensory chaetotaxy is 022/11111 per half tergite.

Head chaetotaxy: a0, d1–d5, sd1–sd5, ocl–oc3, c1, c2, c5, p2–p5 present. Seta c1 behind seta c2.

Body chaetotaxy. Thorax I: m1, m3 and m4 present. Praecoxa I with one capitate seta. Thorax II–III with a1, a4, a5, a7, m7 = s, p1, p2, p4 = s, p5, p7. Thorax II with s'. Praecoxa II–III with one capitate seta and one short seta. Abdomen I–III with a1, a4, a6, p1, p2, p4, p5 = s, p6. Pleurite I–III with one capitate and one short seta. Abdomen IV with a1–a4, a6, m6, p1–p3, p5 = s, p6; m6 and p6 are capitated. Pleurite IV with 2 capitate setae. Abdomen V with a3, a4, a5, p1, p2 = s, p4, p5; a5 and p5 are capitated. Abdomen VI with 3 rows of setae and with p0; a2 capitated. Derivatio nominis: The new species is dedicated to our colleague, Dr. Volker Nicolai.

Comments on the 1st stage of *Probrachystomellides nicolaii* sp. n. (Figs 37–39): Antennal segment IV dorsally with fewer ordinary setae than in adult specimens, with only a dorso-external microsensilla and subapical "organite". The trilobated apical vesicle the same as in adult specimens (Fig. 38). Ventral side of this segment has a little sensory rasp with 10 modified setae (Fig. 39). The sensory organ of antennal segment III the same as in adult specimens.



Figs 35—39: *Probrachystomellides nicolaii* gen. n., sp. n.: 35) antennal segment III and IV, dorsal side; 36) antennal segment III and IV, ventral side; 1st stage: 37) dorsal chaetotaxy; 38) antennal segment III and IV, dorsal side; 39) antennal segment III and IV, ventral side.

The dorsal chaetotaxy as in adult specimens, except for two characters: seta a0 on head and seta m3 on thorax I are absent (Fig. 37).

A dorsal organ is present on the posterior limit of the pronotum tergite. This organ is known in Poduromorpha: Brachystomellinae, Caputanurinae and Neanurinae.

Pseudachorutinae

Pseudachorutes univesicatus sp. n. (Figs 40–48)

Holotype: female; paratypes: 6 males, 2 females, 4 juv. (ISEA); paratypes: 4 males, 2 females, 5 juv. (MNHN).

Type locality: South Africa, Saasveld, near George, subtropical indigenous forest, pitfall traps, 17-XII-1986–17-I-1987, leg. V. Nicolai.

Description: Holotype length 1.3 mm, length of paratypes between 0.8–1.0 mm (males) and 0.9–1.1 mm (females). Colour in alcohol: dark violet in adults and purplish-blue in juvenile stages, ocular plate dark. Tegumental grain very strong.

Antennal segment I with 7 setae, II with 12 setae. Sensory organ of antennal segment III consisting of 2 small sensillae bent in the same direction, 2 guard sensillae and one ventro-lateral microsensilla. Antennal segment IV with trilobate apical vesicle, small subapical "organite", 3 dorso-internal thick subcylindrical sensillae, 2 dorso-external thin subcylindrical ones and one microsensilla (Fig. 40). Ventral side with about 9 modified microsetae (Fig. 41).

Ocelli 8+8. Postantennal organ with only one vesicle divided into 4 unequal branches (Fig. 46). Buccal cone elongated, labrum with 2/2422 setae, labium as Fig. 43, maxillae with two lamellae (Fig. 44), mandible with 4 teeth (Fig. 45).

Tibiotarsi I, II, III with 19, 19, 18 setae, with acuminate tenent hair. Elongated claw with inner basal tooth, without lateral teeth (Fig. 47). Claw III : tibiotarsus ratio = 1 : 1.1. Femur with long ventral seta.

Ventral tube with 4+4 setae. Tenaculum with 3+3 teeth. Dens dorsally with 6 setae and strong granulation, mucro as in Fig. 48. Ratio of claw III : mucro : dens = 1 : 0.8 : 1.2.

Dorsal chaetotaxy as in Fig. 42; sensory setae 1.2–1.3 times longer than ordinary setae. Remarks: head setae a0, sd1–sd5, dl1–d5, c2, c5, pl1–p3, p5 present, ocl absent.

Discussion: The new species differs from all other species of *Pseudachorutes* by the combination of the following characters: postantennal organ composed of a single vesicle divided into 4 branches, absence seta ocl on the head, labral chaetotaxy, shape and structure of labium, shape of mucro and elongated claw.

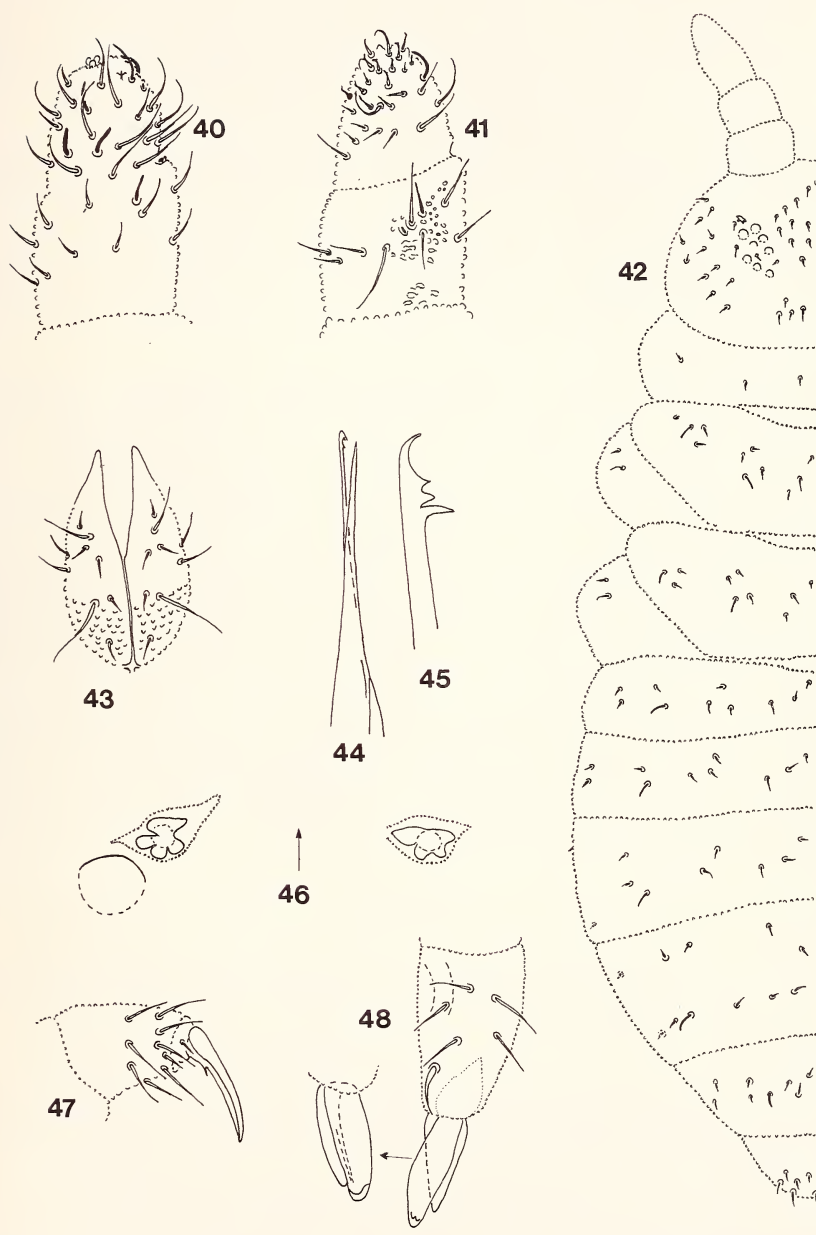
Pseudachorutella africana sp. n. (Figs 49–57)

Holotype: male (ISEA).

Type locality: South Africa, Saasveld, near George, subtropical indigenous forest, pitfall traps, 17-XII-1986–17-I-1987, leg. V. Nicolai.

Description: Holotype length 0.63 mm. Colour in alcohol: grey-bluish, ocular plate dark. Tegumental grain moderate to strong.

Antennal segment I with 7, II with 11 setae. Sensory organ of antennal segment III consisting of 2 small globular sensillae, 2 guard sensillae: dorsal very short,



Figs 40–48: *Pseudachorutes univesicatus* sp. n.: 40) antennal segment III and IV, dorsal side; 41) antennal segment III and IV, ventral side; 42) dorsal chaetotaxy; 43) labium, 44) maxilla; 45) mandible; 46) postantennal organ; 47) leg III; 48) furca.

latero-ventral 3.5 times longer than the dorsal one, and one ventro-lateral microsensilla. Antennal segment IV with trilobated apical vesicle, distinct subapical "organite", 4 dorso-internal, 3 dorso-external subcylindrical thick sensillae, and one microsensilla. Some of the ordinary setae are blunt at top (Fig. 49). Ventral side as in Fig. 50, with 7–8 slightly modified setae.

Ocelli 8+8. Postantennal organ absent.

Buccal cone elongated. Labium as Fig. 51. Maxille with 2 lamellae (Fig. 53), mandible with 3 teeth (Fig. 54).

Tibiotarsi I, II, III with 19, 19, 18 setae., with one acuminate tenent hair. Claw with one inner tooth, without lateral one (Fig. 55).

Ventral tube with 3+3 setae. Tenaculum with 3+3 teeth. Dens with 5 setae, mucro as Fig. 56. Ratio of claw III : mucro : dens = 1 : 0.75 : 1.24.

Genital plate of male as in Fig. 57.

Dorsal chaetotaxy as in Fig. 52. Sensory setae slightly longer than ordinary ones.

Head chaetotaxy: a0 absent, d0, d2–d5, sd1–sd4, ocl–oc3, c1, c2, c5, p2, p3, p5, p6 present. Remarks: anomaly on abd. II — absence of p1 and p2.

Discussion: The new species is described on one specimen only, because it is very important to note for the first time the presence of the genus *Pseudachorutella* Stach, 1949 in Africa. Among all species of *Pseudachorutella*, the new species is close to *P. stachi* Massoud, 1965 from New Guinea. Both species have the same type of maxillae and mandibles, the same number of setae on the dens and instead of sensory rasp some modified setae (7–8 in *P. africana* and 11 in *P. stachi*). They differ by the number of sensillae on ant. IV (8 in *P. stachi*, 7 in *P. africana*), the shape of inner sensillae of sensory organ on ant. III (hammer-shaped in *P. stachi*, globular in *P. africana*), the number of teeth on claw (*P. stachi* has also lateral teeth), the shape of the mucro (external lamella in *P. stachi* with deep indentation) and by dorsal chaetotaxy (in *P. stachi* sensory setae are 3–4 times longer than ordinary ones; there are a1, a2, a3, a4, a5 setae present on abdominal tergite IV and only a1 and a5 setae present in *P. africana*).

Neanurinae

Ectonura sp.

Material: 1 specimen (ISEA), South Africa, Saasveld, near George, on the bark of *Olinia ventosa*, 23-XII-1986, leg. V. Nicolai.

Vitronura sp.

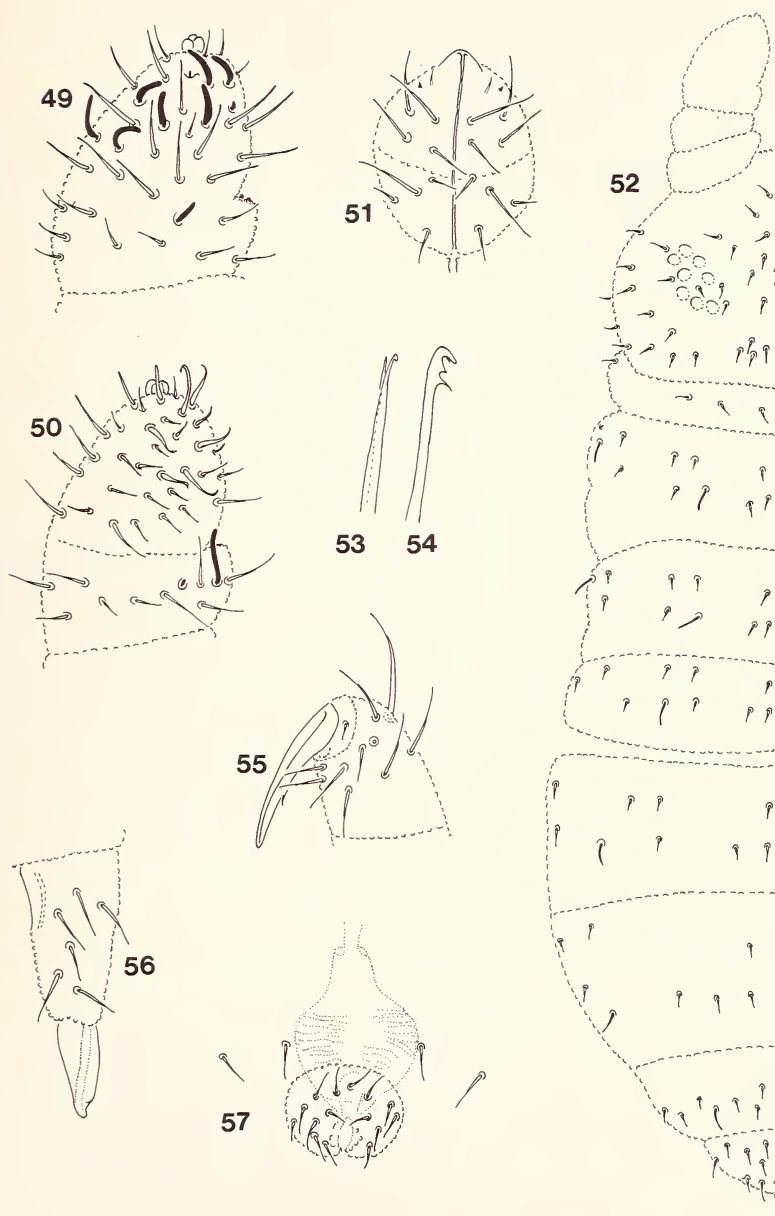
Material: 1 specimen (ISEA), South Africa, Saasveld, near George, on the bark of *Scolopia mundii*, 27-I-1987, leg. V. Nicolai.

Onychiuridae: Onychiurinae

Onychiurus saasveldensis sp. n. (Figs 58–63)

Holotype: male, paratypes: one female and one male (ISEA), paratype: male (MNHN).

Type locality: South Africa, Saasveld, near George, on the bark of *Scolopia mundii*, 27-I-1987, leg. V. Nicolai.



Figs 49—57: *Pseudachorutella africana* sp. n.: 49) antennal segment III and IV, dorsal side; 50) antennal segment III and IV, ventral side; 51) labium; 52) dorsal chaetotaxy; 53) maxilla; 54) mandible; 55) leg III; 56) furca; 57) genital plate of male.

Description: Holotype length 1.40 mm, length of paratypes between 1.1 mm and 1.40 mm. Colour in alcohol white. Tegumental grain strong (diameter of one grain = macrochaeta base) on the dorsal side of head and thorax I—III, moderate (diameter of one grain = mesochaeta base) on the abdomen.

Antennae slightly shorter than head. Sensory organ of antennal segment III consisting of 5 setae at the basis of 4 fairly large papillae, guarding 2 smooth sensory clubs, 2 smooth sensory rods and small ventro-lateral sensilla (Fig. 60). Antennal segment with very small subapical organ and one dorso-external microsensilla in the basal part of this segment.

Postantennal organ with 11—14 compound vesicles (Fig. 59). Labrum with 4/542 setae.

Pseudocellar formula per half segment dorsally: 3(2+1)2/022/33342, ventrally: 11/000/11011. Two pseudocelli on each subcoxa.

Chaetotaxy as in Fig. 58. No distinct sensory setae. Thorax II—III with lateral microsensilla s'. Abdomen IV with seta p0.

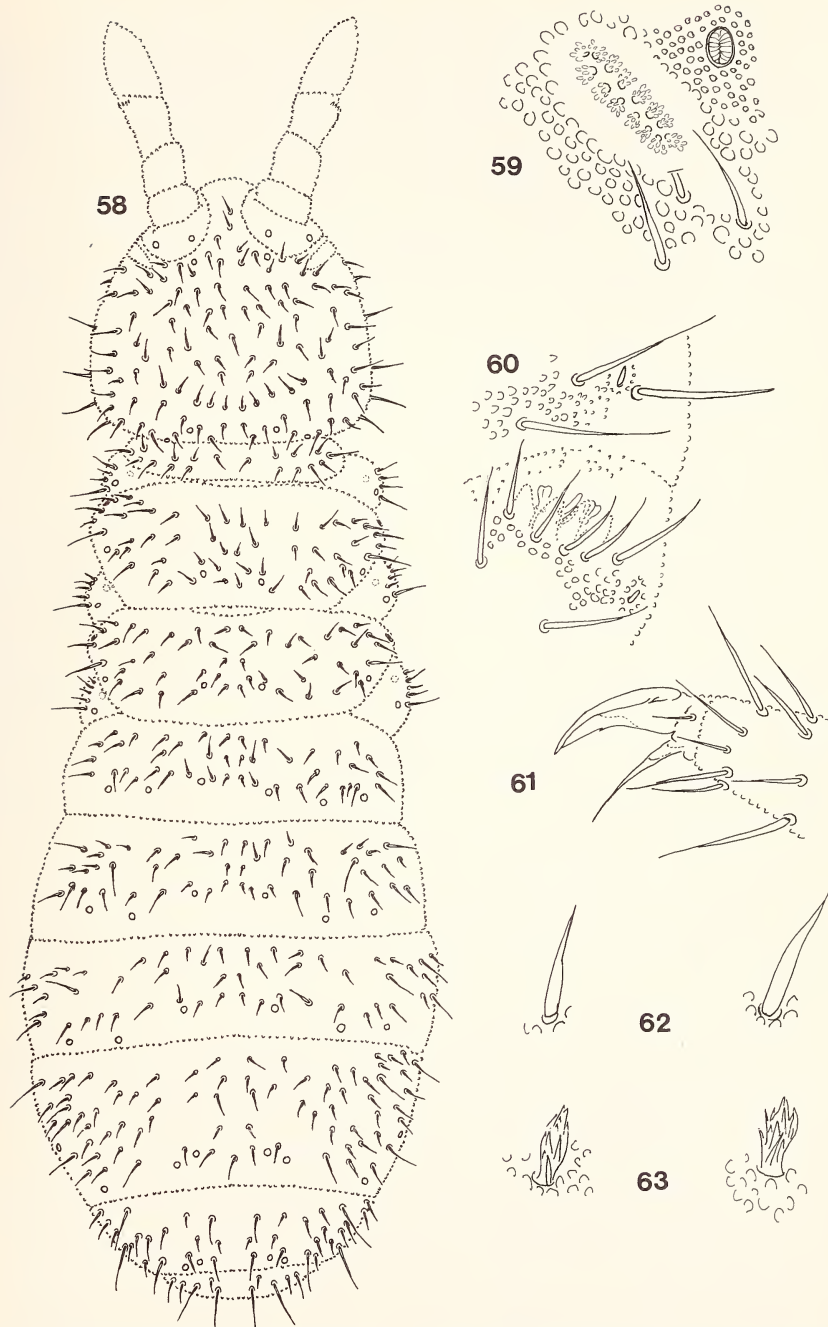
Claw with inner tooth and a pair of lateral teeth. Empodial appendage filiform without basal lamella, the same length as claw (Fig. 61).

Male ventral organ made up of 4 strong modified setae (slightly modified in young specimens) on the abd. II (Figs 62—63). Ventral tube with 6+6 or 5+5 setae.

Discussion: The new species appears as close to 4 species: *O. camerunensis* Schött, 1927 from Cameroon, *O. novaezealandae* Salmon, 1942 from New Zealand, *O. subantarcticus* Salmon, 1949 from Campbell Island, *O. sinensis* Stach, 1954 from China by the same constitution of the sensory organ of antennal segment III and postantennal organ, by the absence of anal spines. *O. saasveldensis* differs by the pseudocellar formula from the following species: *O. novaezealandae* (with 2+11/133/33332), *O. subantarcticus* (with 2+12/022/3334(3)4), *O. camerunensis* (with 2+12/022/33332). *O. sinensis* has almost the same pseudocellar formula: 2+12/022/3333(4)2. The ventral pseudocellar formula is unknown for *O. novaezealandae* and *O. subantarcticus*, but it differs from the formula in *O. camerunensis* (11/000/1111) and *O. sinensis* (1/000/0010). The number of subcoxal pseudocelli is also unknown for *O. novaezealandae*, but it differs in *O. camerunensis* and *O. sinensis* (both species with one pseudocellus on each subcoxa) and *O. subantarcticus* (subcoxae I—III with respectively 211 pseudocelli).

In the new species the claw is very similar to that in *O. novaezealandae* with one inner tooth and a pair of lateral teeth. The claw differs in *O. sinensis* (no lateral teeth), *O. subantarcticus* and *O. camerunensis* (without teeth). Only in *O. camerunensis* the empodial appendage has very small basal lamella: all other species have no basal lamella. The length of empodial appendage is the same in the new species, in *O. novaezealandae* and in *O. sinensis* and the same as the length of claw. In *O. camerunensis* and *O. subantarcticus* it is a little shorter (5/6 of the claw length).

Further differences concern the granulation of the cuticula. It is fine in *O. sinensis*, *O. novaezealandae* and *O. camerunensis*. In *O. subantarcticus* the body is coarsely granulated and in *O. saasveldensis* tegumental grains are strong on head and on thorax I—III, but moderate on abdomen.



Figs 58—63: *Onychiurus saasveldensis* sp. n.: 58) dorsal chaetotaxy; 59) postantennal organ and one pseudocellus; 60) sensory organ of antennal segment III and microsensilla of antennal segment IV; 61) leg III; 62) modified setae of abdomen II in young male; 63) modified setae of abdomen II in adult male.

Zusammenfassung

Es wird über 10 Arten von Collembola Poduromorpha berichtet, die in einem subtropischen Regenwald bei George in Südafrika gesammelt wurden. Eine neue Gattung, *Probrachystomellides* gen. n., und acht neue Arten, *Xenylla capensis* sp. n., *Odontella (Odontella) sylvatica* sp. n., *Brachystomella coatesi* sp. n., *B. georgensis* sp. n., *Probrachystomellides nicolaii* sp. n., *Pseudachorutes univesicatus* sp. n., *Pseudachorutella africana* sp. n., *Onychiurus saasveldensis* sp. n., werden in dieser Arbeit beschrieben.

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